

Appl. No. 09/681,525

Andr. dated 08/31/2003

Reply to Office action of 03/23/2003

Amendments to the Claims:

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

Claim 1 (currently amended): ~~The method~~ Method of manufacturing a multi-tube fluorescent discharge lamp, wherein the finished lamp comprises an first glass tube, an second glass tube, which is slightly larger than the first glass tube; two cathode portions, and phosphor; said method comprising the steps of:

- a) forming ~~[[a]]~~ an isolator nearby the middle of the first glass tube;
- b) perforating through-holes nearby the both ends of the first glass tube;
- c) coating phosphor on ~~||the||~~ an outer surface of the first glass tube;
- d) coating phosphor on ~~||the||~~ an inner surface of the second glass tube~~||,||~~
~~which is slightly larger than the first glass tube;~~
- e) installing two cathode portions, each includes a pair of electrodes, a pipe, a stem and a hole, at respective the both ends of the first glass tube;
- f) fusing the two ends of the first glass tube with the cathode portions;
- g) installing the first glass tube into the second glass tube in coaxial;
- h) fusing the two ends of the first glass tube and the second glass tube;
- i) drying the phosphor layer and sealing one of the pipe by heat;
- j) injecting Hg as several mg into the discharge chamber from the other opening pipe;
- k) vacuuming the discharge chamber from the other opening pipe ;
- l) filling Ar gas as several hundreds Pa in pressure into the discharge chamber;
- m) sealing the other opening pipe;
- n) agitating the liquid Hg into vapor Hg;
- o) installing two bases to respective ends of the discharge tube.

Claim 2 (currently amended): ~~The method~~ Method of manufacturing a multi-tube fluorescent discharge lamp, wherein the finished lamp comprises an first glass tube, an second glass tube, which is slightly larger than the first glass tube; an third glass tube, which is slightly larger than the second glass tube; two cathode portions, and phosphor; said method comprising the steps of:

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- a) forming an isolator nearby the middle of the first glass tube, two discharge chambers are formed;
- b) perforating through-holes nearby the both ends of the isolator of the first glass tube;
- c) perforating through-holes nearby the both ends of the second glass tube ~~[[.]] which is slightly larger than the first glass tube~~;
- d) installing the first glass tube into the second glass tube in coaxial;
- e) forming an isolator nearby the middle of the second glass tube correspond to the isolator of the first tube, two discharge chambers are formed;
- f) coating phosphor on ~~[[the]]~~ an outer and inner surface of the first glass tube and second glass tube;
- g) coating phosphor on the inner surface of the third glass tube ~~[[.]] which is slightly larger than the second glass tube~~;
- h) installing two cathode portions, ~~each includes a pair of electrodes, a pipe, a stem and a hole~~, at respective the both ends of the first glass tube;
- i) fusing the two ends of the first glass tube with the cathode portions ;
- j) installing the combination of the first glass tube and second glass tube into the third glass tube in coaxial;
- k) fusing the two ends of all glass tubes;
- l) drying the phosphor layer and sealing one of the pipe by heat;
- m) injecting Hg as several mg into the discharge chamber from the other opening pipe;
- n) vacuuming the discharge chamber from the other opening pipe;
- o) filling Ar gas as several hundreds Pa in pressure into the discharge chamber;
- p) sealing the other opening pipe;
- q) agitating the liquid Hg into vapor Hg;
- r) installing two bases to respective ends of the discharge tube.

Claim 3 (currently amended): The method of claim 1 or 2, wherein said the isolator of the first glass tube is performed by heating ~~at the circumference to approach the middle of the first glass tube for softening and is rotated in the reverse direction at both ends of the tube, and is twisted at the soften place then fusing into an isolator to seal the pipeline of the first glass tube, thus, forming two discharge chambers~~ toward the middle of the first glass tube, and rotation is made at both ends of the first glass tube in mutually reverse direction, the softened part of the tube is twisted and fused into an isolator that blocks the pipeline of the first tube and forms two discharge chambers.

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Claim 4 (currently amended): The method of claim 1, wherein said the through-holes of the first glass tube are performed by blowing the air in from both ends of the first glass tube, ~~or at one end of the first glass tube is air tight and the air is blown in from another end,~~ also heating is performed ~~nearby both ends of isolator on the two circumferences at the position of plural number,~~ thus the through hole of plural number are formed at several spots around the ends, resulting in the plural-numbered through-holes.

Claim 5 (currently amended): The method of claim 2, wherein said the through-holes of the first glass tube is performed by blowing ~~[[the]]~~ air in ~~from both ends of the first glass tube,~~ also heating is performed ~~nearby both ends of the isolator on the two circumferences at the position of plural number~~ thus the through hole of plural number are formed into the first glass tube from both ends, and heating is performed at several points around the two sides of the isolator, the plural-numbered through-holes 14 are formed.

Claim 6 (currently amended): The method of claim 2, wherein said the through-holes of the second glass tube is performed by blowing ~~the air in from both ends of the second glass tube,~~ ~~or at one end of the second glass tube is air tight and the air is blown in from another end,~~ also heating is performed ~~nearby both ends on the two circumferences at the position of plural number~~ thus the through hole of plural number are formed into the second glass tube from both ends, and heating is performed at several spots around both ends of the tube, the plural-numbered through-holes are formed.

Claim 7 (currently amended): The method of claim 2, wherein said the isolator of the second glass is performed by heating ~~on the circumference of the second glass tube correspond to the isolator of the first glass tube,~~ also, rotation is made with reverse direction at both ends of the second glass tube, and is twisted at the softening place of the tube ~~thus fusing into another isolator with the first glass tube to seal the pipeline of the second glass tube and separating separates the discharge path of the second glass tube into two discharge chambers around the second glass tube, at a place that corresponds to the position of the isolator in the first glass tube, and then rotation is made at both ends of the second glass tube in mutually reverse direction, the heated, softened middle part of the tube is fused with the first glass tube into another isolator that blocks the pipeline of the second glass tube and separates the discharge path of the second tube into two discharge chambers.~~

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Claim 8 (currently amended): ~~The method~~ Method of manufacturing a multi-tube fluorescent discharge lamp, wherein the finished lamp comprises an first glass tube, an second glass tube, which is slightly larger than the first glass tube; an third glass tube, which is slightly larger than the second glass tube; two cathode portions, and phosphor; said method comprising the steps of:

- a) installing two cathode portions, each includes a pair of electrodes, a pipe, a stem and a hole, at respective the both ends of the first glass tube;
- b) forming an isolator nearby the middle of the second glass tube, ~~which is slightly larger than the first glass tube~~ two discharge chambers are formed;
- c) perforating through-holes nearby the both ends of the second glass tube;
- d) coating phosphor on ~~[[the]]~~ an outer surface of the first glass tube;
- e) coating phosphor on ~~[[the]]~~ an inner and outer surface of the second glass tube;
- f) coating phosphor on the inner surface of the third glass tube, which is slightly larger than the second glass tube;
- g) installing the two first glass tubes into respective the two chambers of the second tube in coaxial;
- h) fusing the two ends of the first glass tube and the second glass tube;
- i) installing the combination of the first glass tube and the second glass tube into the third glass tube in coaxial;
- j) fusing the two ends of all glass tubes;
- k) drying the phosphor layer and sealing one of the pipe by heat;
- l) injecting Hg as several mg into the discharge chamber from the other opening pipe;
- m) vacuuming the discharge chamber from the other opening pipe
filling Ar gas as several hundreds Pa in pressure into the discharge chamber;
- n) sealing the other opening pipe;
- o) agitating the liquid Hg into vapor Hg;
- p) installing two bases to respective ends of the discharge tube.

Claim 9 (currently amended): The method of claim 8, wherein the first tube is a round straight glass tube, in which a pair of electrodes and one pipe with said tube are slid in coaxial, ~~and heating at one end of the tube for softening, by means of clamping, pressing and sealing the tube, the pair of electrodes and pipe can be fixed, air is blown into the pipe, by means of the heating at the end of sealed, a hole can be extruded, install cathode on the pair of electrode~~

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inserted to form a coaxial structure, one end of the first glass tube is heated for softening, and then clamped, pressed and sealed, the pair of electrodes and the pipe can be fixed, and air is blown into the pipe, by heating the sealed end, a hole can be produced for exhaust to pass through the pipe.

Claim 10 (currently amended): The method of claim 8, wherein said the through-holes of the second glass tube is performed by blowing [the] air in from both ends of the second glass tube, or one end of the said tube is air tight and the air is blown in from another end, also, ~~heating is performed on the circumferences to approach both ends of the second glass tube at the position of plural number thus extruding the through hole with plural number~~ the other end, heating is performed around several spots on both ends of the second glass tube, thus producing the plural-numbered through-holes.

Claim 11 (currently amended): The method of claim 8, wherein said the isolator of the second glass tube is performed by heating ~~on the circumference of the second glass tube to approach the middle of the second glass tube, also, rotation is made with reverse direction at both ends of the second glass tube, and is twisted at the softening place of the tube thus fusing into an isolator to seal the pipeline of the second glass tube and separating the discharge path of the second glass tube into two discharge chambers toward the middle part~~ of the second glass tube, and both ends are rotated in mutually reverse direction so that the tube is twisted in the middle, where it is fused into an isolator that blocks the path of the discharge tube and separates the discharge path of the second glass tube.

Claim 12-18 (canceled)